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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/751,467	01/06/2004	Yun-gi Kim	1349.1341	2354
21171 7590 03/30/2007 STAAS & HALSEY LLP SUITE 700 1201 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			EXAMINER MRUK, GEOFFREY S	
			ART UNIT	PAPER NUMBER
			2853	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		03/30/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/751,467

Applicant(s)

KIM ET AL.

Examiner

Geoffrey Mruk

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3 and 25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3 and 25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12 January 2007 has been entered.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, and 3 are rejected under 35 U.S.C. 102(e) as being anticipated by Pollard (US 6,540,337 B1).

With respect to claim 1, Pollard discloses a bubble-ink jet print head (Fig. 5) comprising:

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- a substrate (Fig. 5, element 606) having ink chambers (Fig. 5, element 622) to store ink and resistance heat emitting bodies (Fig. 5, element 614) to heat ink (Column 4, lines 66-67) disposed thereover, and
- an ink supply passage (Fig. 5, element 604a) which penetrates the substrate, extends beyond the substrate (Fig. 5, element 620), and which is connected with the ink chambers, the ink supply passage including:
  - a first trench (Fig. 8a, elements 802f, 808) formed at a first surface of the substrate (Fig. 8a, element 806) in a first pattern having a separating distance from at least one of inlets of the ink chambers and connecting portions between the adjacent ink chambers, the first surface of the substrate having the ink chambers disposed thereover (Fig. 5, element 618), and
  - a second trench (Fig. 8a, element 805p, 805q) formed at a second surface of the substrate (Fig. 8a, element 806) in a second pattern, having an area equal to or smaller than that (Fig. 12, element w) of the first trench in the range of the first pattern of the first trench, and directly connected to (Column 7, lines 56-58, i.e.  $w_1$  of 802f and Column 8, lines 10-19, i.e.  $w_3$  of 804) with the first trench, wherein the first trench has a depth (Fig. 8a, element t) from  $5\mu\text{m}$  to  $20\mu\text{m}$  (Column 5, lines 24-26, i.e. thickness t from  $100\mu\text{m}$ - $2000\mu\text{m}$ ; Column 7, lines 61-63, i.e. 10-80% of t).

With respect to claim 3, Pollard discloses a bubble-ink jet print head (Fig. 5) comprising:

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- a substrate (Fig. 5, element 606) having ink chambers (Fig. 5, element 622) to store ink and resistance heat emitting bodies (Fig. 5, element 614) to heat ink (Column 4, lines 66-67) disposed thereover, and
- an ink supply passage (Fig. 5, element 604a) which penetrates the substrate, extends beyond the substrate (Fig. 5, element 620), and which is connected to the ink chambers, the ink supply passage including:
  - a first trench (Fig. 8a, elements 802f, 808) formed at a first surface of the substrate (Fig. 8a, element 806) in a first pattern having a separating distance from at least one of inlets of the ink chambers and connecting portions between the adjacent ink chambers, the first surface of the substrate having the ink chambers (Fig. 5, element 618) disposed thereover and
  - a second trench (Fig. 8a, element 805p, 805q) formed at a second surface of the substrate (Fig. 8a, element 806) in a second pattern, having an area equal to or smaller than that (Fig. 12, element w) of the first trench in the range of the first pattern of the first trench, and directly connected to (Column 7, lines 56-58, i.e.  $w_1$  of 802f and Column 8, lines 10-19, i.e.  $w_3$  of 804) the first trench, wherein the separating distance (Column 8, lines 3-5, i.e. shallow shelf) is from  $1\mu\text{m}$  to  $5\mu\text{m}$  (Column 7, lines 55-57, i.e. trench widths; Column 8, line 4, i.e. 5-150% of the trench width).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pollard (US 6,540,337 B1) in view of Feinn et al. (US 6,561,632 B2).

With respect to claim 25, Pollard discloses an inkjet print head (Fig. 5), comprising:

- a substrate (Fig. 5, element 606), at least one heater (Fig. 5, element 614) formed on a top surface of the substrate which heats ink disposed (Column 4, lines 60-67),
- an ink chamber (Fig. 5, element 622) disposed at least partially over the at least one heater, and an ink supply opening extending through the substrate (Fig. 5, element 620), the ink passage in fluidic communication with the ink supply chamber and the ink chamber, the ink supply opening including
- a first trench (Fig. 8a, elements 802f, 808) formed at an ink chamber side of the substrate (Fig. 8a, element 806) in a first pattern having a separated distance from at least one of inlets of the ink chambers and connecting portions between the adjacent ink chambers, and
- a second trench (Fig. 8a, element 805p, 805q) formed at a second surface of the substrate (Fig. 8a, element 806) in a second pattern, having an area equal to or

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area smaller than that (Fig. 12, element w) of the first trench in the range of the first pattern of the first trench, directly connected to (Column 7, lines 56-58, i.e.  $w_1$  of 802f and Column 8, lines 10-19, i.e.  $w_3$  of 804) the first trench, wherein the first trench has a depth (Fig. 8a, element t) from  $5\mu\text{m}$  to  $20\mu\text{m}$  (Column 5, lines 24-26, i.e. thickness t from  $100\mu\text{m}$ - $2000\mu\text{m}$ ; Column 7, lines 61-63, i.e. 10-80% of t).

However, Pollard fails to disclose a protective layer formed on the at least one heater.

Feinn discloses a printhead where "Over the resistors 24 and AlCu metal layer is formed a silicon nitride ( $\text{Si}_3\text{N}_4$ ) layer 46, having a thickness of 0.5 microns.

At the time of the invention, it would have been obvious for one of ordinary skill in the art to use the silicon nitride layer disclosed by Feinn on the resistors of Pollard. The motivation for doing so would have been "This layer provides insulation and passivation" (Column 4, lines 30-33).

### ***Response to Arguments***

Applicant's arguments filed 12 January 2007 have been fully considered but they are not persuasive. The applicant's argument that "By the aforementioned features, influence on the chamber and heater on the first surface of the substrate is minimized by forming the first trench on one surface of the substrate and the second trench on another surface of the substrate. This advantage is recognized by neither Pollard nor

Feinn et al. Thus, it is submitted that the aforementioned feature is not obvious over the cited art.”

Pollard discloses slotted substrates incorporated into printers having a trench, slot, and a shallow shelf portion where “The trench can have widths of 30 microns to about 300 microns with some embodiments utilizing 200 microns” (Column 7, lines 58-59) and “The various slots 804 can have a wide range of dimensions and shapes. Some exemplary embodiments can utilize cylindrical slots having a diameter ranging from about 30 microns to about 300 microns” (Column 8, lines 10-13). Since width of the trench ( $w_1$ ) and the width of the slot ( $w_3$ ) may well be equal, Pollard meets the claimed limitation(s).

### ***Conclusion***

All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to entry under 37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing of a request for continued examination and the submission under 37 CFR 1.114. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not



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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Geoffrey Mruk whose telephone number is 571 272-2810. The examiner can normally be reached on 7am - 330pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on 571 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

GSM

3/26/2007

GM

  
**STEPHEN MEIER**  
**SUPERVISORY PATENT EXAMINER**